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NEW OR LITTLE KNOWN PHYLINE PLANT BUGS OF JAPAN (HETEROPTERA: MIRIDAE: PHYLINEAE)*

By TOMOHIDE YASUNAGA

Abstract

YASUNAGA, T., 1999. New or little known phylinae plant bugs of Japan (Heteroptera: Miridae: Phylinae). *Ins. matsum. n. s.* 55: 181–201, fig. 6.

Sixteen Japanese species in 9 genera of the phylinae plant bugs are dealt with. Two new genera, *Pseudophylus* and *Atractotomoidea*, are proposed to accommodate *Phylus stundjuki* Kulik and a new species *Atractotomoidea castanea* Yasunaga, respectively. *Phylus miyamotoi*, *Compsidolon elaeagnicola*, *Phoenicocoris ryukyuensis*, *Decomia okutoshii*, *Opuna pallidula* and *Moissonia befui* are also described as new to science. *Psallus senjoensis* Linnavuori is transferred to *Plagiognathus*, and all other taxa are diagnosed. A key is provided to distinguish the Japanese species of *Plagiognathus*.

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INTRODUCTION

The plant bug subfamily Phylinae is a vast group within the Miridae, including numerous genera and species throughout the world. Most members of the subfamily are small in size, and it is sometimes difficult to identify the taxa properly. Several authors (e.g., Linnavuori, 1961; Matsumura, 1911; Miyamoto, 1969; Schuh, 1984) have hitherto treated the Japanese phylina taxa fragmentarily, and only 42 species in 16 genera are currently known. Needless to say, the Japanese phylina fauna is still in great need of investigation.

This study is the first part in a series of papers planned to clarify Japanese phylina fauna. In the present paper, 16 new or little known species under 9 genera are reported, with descriptions of 2 new genera and 7 new species. New combinations are proposed for 2 known species. A key is provided to distinguish 4 Japanese species of *Plagiognathus*.

All measurements are given in millimeters. In the synonymic listings, only selected references are cited for each taxon (detailed lists, see Schuh, 1995). Depositories of material examined are abbreviated in the text as follows: AMNH, Department of Entomology, American Museum of Natural History, New York; BMNH, Department of Entomology, the Natural History Museum, London; HUES, Hokkaido University of Education, Sapporo; MC, Dr. Miyamoto's personal collection, Fukuoka City; SEHU, Systematic Entomology, Hokkaido University, Sapporo; ZISP, Zoological Institute, Russian Academy of Sciences, St. Petersburg.

SYSTEMATIC PART

Phylus Hahn, 1831

Phylus Hahn, 1831: 26, type species: *Phylus pallipes* Hahn, 1831, monotypic.

This is a small Palearctic genus composed of 9 members. The genus is easily recognized by the elongate, slender body with uniformly distributed, simple pubescence on dorsum. In Japan, only one species is currently known. Detailed diagnostic characters were provided by Wagner and Weber (1964), Wagner (1975), etc.

Phylus miyamotoi n. sp. (Figs. 1 A & B; 4 A)

Phylus coryloides: Miyamoto, 1988: 638; Miyamoto & Yasunaga, 1989: 163 (nec Josifov & Kerzhner, 1972).

Body slender, nearly parallel-sided; dorsal surface shiny black, uniformly clothed with a simple, silky, reclining pubescence. Head oblique; vertex slightly pale. Antennal segments I and II usually blackish brown, sometimes partly or rarely entirely yellow; segments III and IV yellow or yellowish brown; lengths of segments I-IV (σ / φ): 0.29/ 0.26, 1.68/ 1.54, 0.70/ 0.77, 0.47/ 0.48. Rostrum yellowish brown, reaching metacoxa; segment I and apical part of IV infuscate. Pronotum slightly longer than twice as long as basal width, minutely punctate, with shagreened anterior margin; scutellum flat, shallowly and transversely rugose; thoracic pleura entirely dark brown. Hemelytra unicolorously fuscous, minutely punctate; membrane dark grayish brown. Coxa and leg creamy yellow; tibial spines and tarsus pale brown; lengths of metafemur, tibia and tarsus (σ / φ): 1.38/ 1.51,

2.16/2.17, 0.48/0.49, Abdomen shiny blackish brown, much shorter than apex of membrane. Male genitalia (Fig 1 A-B): Left paramere with long, slender hypophysis (A); vesica long, S-shaped, tapered apically, with subapical pointed spine and hooked apex (B).

Dimensions (σ/φ): Body length 4.5/ 4.5; head width 0.83/ 0.80; vertex width 0.34/ 0.41; rostral length 1.50/ 1.62; mesal pronotal length 0.66/ 0.72; basal pronotal width 1.23/ 1.34; width across hemelytra 1.46/ 1.68.

Holotype σ , Mt. Nekogadake, Suzu C., Ishikawa Pref., Honshu, Japan, 8. vii. 1993, Y. Nakatani (HUES). Paratypes: Twenty-three specimens (HUES, MC, SEHU) from the following localities: [Hokkaido] Chubetsu, Bibai T., Sorachi. [Honshu] same as holotype; Shirahone, Azumi Vil., Nagano Pref.; Kisojihar, Nagawa Vil., Nagano Pref.; Uchiyama, Saku C., Nagano; Yotsuyama, Ogawa, Saitama Pref.; Chojabaru & Mt. Kakezu, Geihoku T., Hiroshima Pref. [Shikoku] Kuroson, Kochi Pref.; Odamiyama, Ehime Pref. [Kyushu] Shirokosen, Mts. Kuju, Oita Pref.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu).

This new species was previously regarded as *P. coryloides* Josifov et Kerzhner described from N. Korea by Miyamoto (1987), who could examine the female specimens only (Miyamoto, pers. commun.). But the present examination of the male genitalia revealed that the Japanese population is not conspecific with *coryloides*. The vesical shape of *miyamotoi* is rather similar to that of the European *P. coryli* (Linnaeus).

P. miyamotoi has been collected from fagaceous *Quercus mongolica* and other deciduous trees, and occasionally attracted to light. No other information is available on its biology.

Pseudophylus n. gen.

Type species: *Phylus stundjuki* Kulik, 1973.

Similar in general appearance to *Phylus*, but this new genus is distinct in having the following characters: Body small, suboval, 3.2-3.4 in length; dorsal surface with uniform, dark, stiff, suberect setae; head subvertical, short; vertex with a narrow but distinct basal transverse carina; antennal segment II short, about 4 times as long as I; rostrum short, not exceeding mesocoxa; pronotum rather tumid and broad; ostiolar peritreme conspicuously projected mesially; left paramere tiny, with projected sensory lobe (Fig. 1, C); vesica simple in form, broad and short, nearly C-shaped (D).

A single representative of the new genus, *stundjuki*, is apparently not a member of *Phylus*, judging from the above mentioned characters. Especially, the strongly projected mesial part of the ostiolar peritreme is regarded as an autapomorphy for *Pseudophylus*.

Pseudophylus stundjuki (Kulik) n. comb. (Figs. 1 C & D; 4 B)

Heterocordylus flavipes Nitobe, 1906: 19, junior secondary homonym of *Cimex flavipes* Scopoli, 1763; Miyamoto & Yasunaga, 1989: 163.

Phylus stundjuki Kulik, 1973: 22; Schuh, 1995: 378; Yasunaga et al., 1996: 93 (= *H. flavipes* Nitobe).

Recognized by the small size, dark brown dorsal surface, yellow coxa and leg, sometimes slightly infuscate mesial part of the metafemur, and the characters mentioned in generic diagnosis. The specimens from the Russian Primor'je have the reddish femora. But

they are considered to be conspecific with Japanese ones, because no significant differences are exhibited in the external structure and male genitalia.

This species was well known as the most serious pest injurious to apple in early 20th century (Munakata, 1909), but nowadays becomes rare probably due to subsequent chemical control. Kerzhner (1988a) recognized its host plants as a pear, *Pyrus ussuriensis* of the Rosaceae. In my recent investigation, several specimens were found from rosaceous *Marus sieboldi* and leguminous *Maackia amurensis* in Hokkaido. I also collected a female sitting on *Artemisia* sp. (Compositae) in the Primor'je.

Dimensions (♂ / ♀): Body length 3.2/ 3.3; head width including eyes 0.70/ 0.67; vertex width 0.28/ 0.29; lengths of antennal segment I 0.24/ 0.24, II 0.98/ 1.01, III 0.50/ 0.50, IV 0.37/ 0.36; rostral length 1.02/ 1.20; mesal pronotal length 0.57/ 0.54; basal pronotal width 1.14/ 1.10; width across hemelytra 1.25/ 1.32; lengths of metafemur 1.04/ 1.08, tibia 1.56/ 1.56, tarsus 0.41/ 0.39.

Material examined. Sixteen specimens (HUES, MC, SEHU, ZISP) from the following localities: JAPAN: [Hokkaido] Etanbetsu, Asahikawa C.; Hokkaido Univ. Exp. Forest, Takaoka, Tomakomai C. [Honshu] Aomori (without detailed locality, lectotype of *Heterocordylus flavipes* Nitobe, SEHU); Togakushi Vil., Nagano Pref. RUSSIA: Ussury, Primorskij Kraj; 10 km E of Novaja Moskva.

Distribution. Japan (Hokkaido, Honshu), Russian Far East (Primorskij Kraj).

Plagiognathus Fieber, 1858

Plagiognathus Fieber, 1858: 320, type species: *Lygaeus arbustorum* Fabricius, 1784, subsequent designation.

This genus and *Europiella* Reuter, 1909 had been frequently confused with each other, until Schuh et al. (1995) provided a good definition for the latter genus. Japanese fauna of *Plagiognathus* is represented by 4 members that are recognized by the slender, parallel-sided body (but somewhat oval in ♀), pale green to fuscous general coloration, dark simple setae on dorsum (exceptionally both dark setae and silvery pubescence presenting in *senjoensis*), pale but spotted and/or striped metafemur, long tarsus, rather elongate right paramere, and heavily sclerotized vesica with the bifurcate apex.

KEY TO JAPANESE SPECIES OF *PLAGIOGNATHUS*

1. Hemelytra with both sericeous, short, reclining pubescence and brown, simple setae *P. senjoensis*
- Hemelytra with dark, simple vestiture 2
2. Dorsal surface unicolorously pale green *P. chrysanthemi*
- Dorsal surface more or less darkened, or at least head and pronotal calli infusate 3
3. Body smaller, less than 3.6 mm in length; hemelytra shiny blackish brown ... *P. yomogi*
- Body larger, more than 4 mm in length; hemelytra less shining, partly shagreened or pruinose, blackish brown or sometimes somber pale green *P. collaris*

Plagiognathus chrysanthemi (Wolff) (Fig. 4 F)

Miris chrysanthemi Wolff, 1804: 154.

Plagiognathus chrysanthemi: Reuter, 1883: 452; Miyamoto, 1969: 88; Miyamoto & Yasunaga,

1989: 163; Schuh, 1995: 383.

Easily recognized by the generally pale green body with contrastingly dark setae on dorsum, dark apex of the tylus, a basal and a subapical dark rings on the antennal segment I, and infusate base of the antennal segment II. Sometimes confused with certain species of *Europiella* (e.g., *E. miyamotoi* (Kerzhner), see Yasunaga et al., 1993) exhibiting similar pale coloration, this species is easily separable from it by the above mentioned characters. Redescriptions were provided by many European authors and by Miyamoto (1969, in Japanese).

P. chrysanthemi is a polyphagous feeder, having been collected from many kind of herbaceous plants in Hokkaido. The biology is summarized by Wheeler and Henry (1992).

Dimensions (σ / φ): Body length 4.0/ 3.7; head width 0.77/ 0.77; vertex width 0.36/ 0.38; lengths of antennal segment I 0.29/ 0.25, II 1.24/ 1.06, III 0.80/ 0.80, IV 0.50/ 0.43; rostral length 1.48/ 1.44; mesal pronotal length 0.57/ 0.54; basal pronotal width 1.14/ 1.10; width across hemelytra 1.44/ 1.50; lengths of metafemur 1.44/ 1.32, tibia 2.04/ 1.86, tarsus 0.60/ 0.55.

Material examined. Fifty-six specimens (BMNH, HUES, SEHU) from the following localities: JAPAN: [Hokkaido] Ainosato, Sapporo, C.; Ban'naguro, Ishikari C.; Omusaro & Komuke, Mombetsu C. RUSSIA: Rjazanovka, Khasanskij Dist., Primor'je. AUSTRIA: Lunz & Gloggnitz.

Distribution. Japan (Hokkaido), Holarctic Region. The Nearctic populations are considered to have been introduced from the Palearctic Region (Wheeler and Henry, 1992).

Plagiognathus collaris (Matsumura)

(Figs. 1 E-G; 4 C & D)

Chlamydatus collaris Matsumura, 1911: 40; Yasunaga et al., 1996: 92 (lectotype designation).

Plagiognathus collaris: Miyamoto, 1969: 86; Miyamoto & Yasunaga, 1989: 163; Schuh, 1995: 384.

Plagiognathus sp. Endo et al., 1998: 18.

Recognized by the elongate (σ) or elongate-oval (φ) body, usually fuscous dorsal coloration, pale mesial fascia on the vertex, dark stripes on the metafemoral margins, and the genital structure. This species exhibits two types of color variation: Dorsal surface entirely black and metafemoral dark stripes distinct (1); pronotum and hemelytra yellowish except for fuscous calli, and metafemoral stripe reduced (2). The final instar nymphs are easily recognized by the somber pale green body with the distinctly annulate antenna and fuscous stripes on the femora (Fig. 4, D).

The breeding host plants were confirmed to be rosaceous *Filipendula kamtschatica* and leguminous *Vicia japonica*. My observations in Hokkaido suggest that only blackish specimens have been found on the former plant, whereas those with pale dorsum have been liable to be collected from the latter. Some teneral adults were also found on *Artemisia* spp. This mirid has a univoltine life cycle, and the adults appear from mid July to mid August.

Dimensions (σ / φ): Body length 4.5/ 4.3; head width 0.81/ 0.89; vertex width 0.36/ 0.43; lengths of antennal segment I 0.35/ 0.31, II 1.38/ 1.25, III 0.87/ 0.88, IV 0.46/ 0.48; rostral length 1.56/ 1.56; mesal pronotal length 0.68/ 0.70; basal pronotal width 1.30/ 1.36; width across hemelytra 1.61/ 1.79; lengths of metafemur 1.62/ 1.50, tibia 2.40/ 2.28, tarsus 0.65/ 0.60.

Material examined. More than 200 specimens (HUES, SEHU) from the following localities:

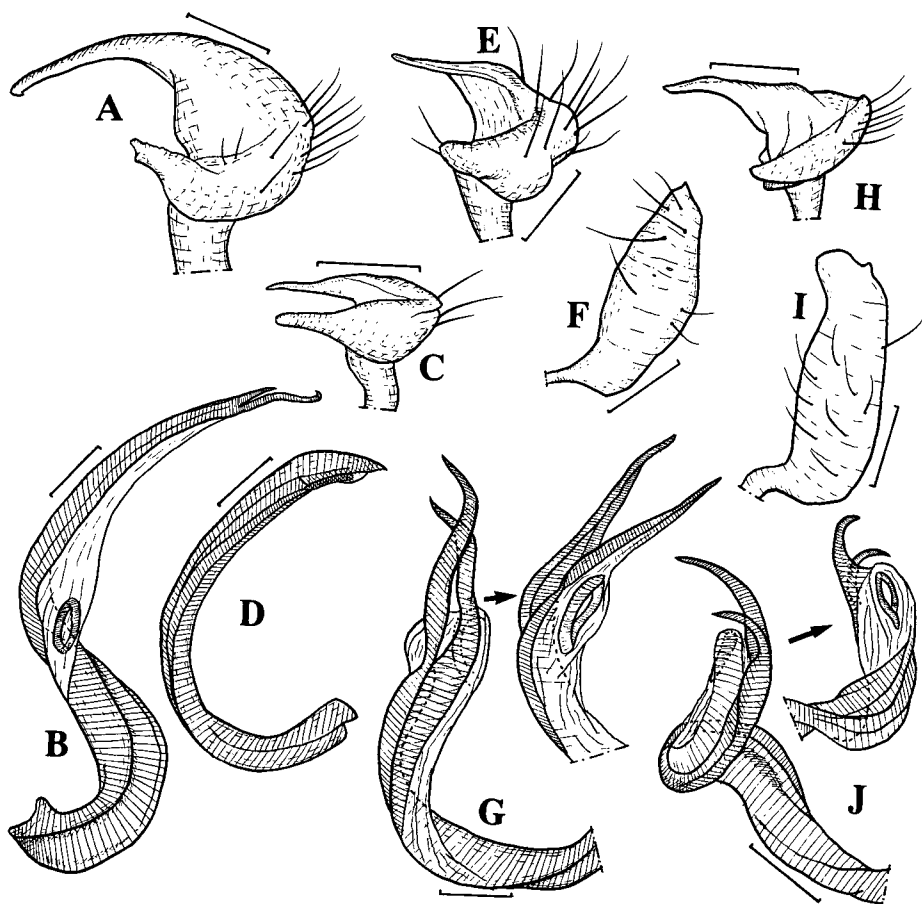


Fig. 1. Male genitalia of *Phylus miyamotoi* (A-B), *Pseudophylus stundjuki* (C-D), *Plagiognathus collaris* (E-G) & *Pl. senjoensis* (H-J). A, C, E & H, left paramere; F & I, right paramere; B, D, G & J, vesica. Scales: 0.1 mm.

JAPAN: [Hokkaido] Etanbetsu, Asahikawa C.; Aoyama, Tobetsu T.; Komuke, Monbetsu C. [Honshu] Tsumagoi Vil., Gunma Pref.; Minoto, Mt. Akadake, 2,000-2,500 m alt., Yatsugatake Mts., Nagano Pref.; Kisojihar, Nagawa Vil., Nagano Pref.; Mt. Daibosatsu, Yamanashi Pref. KURIL ISLS.: Alekhino, Kunashiri Is. RUSSIA: [Primor'je] SW of Kurounovka, nr. Mt. Medvezh'ja; Sergeevka; 10 km E of Novaja Moskva; Ussury Natural Reserve; Rjazanovka, Khasanskij Dist.; Mt. Oblachnaja, 600 m alt.; Shkotobo. [Sakhalin] ♀ lectotype from Solowiofka and 4 paralectotypes from Tonnaicha & Galkino (SEHU); Toyohara (=Yuzhno-Sakhalinsk) (SEHU).

Distribution. Japan (Hokkaido, Honshu), Kuril Isls., Russian Far East (incl. SE. Siberia), China.

Plagiognathus senjoensis (Linnavuori) n. comb.
(Fig. 1 H-J)

Psallus senjoensis Linnavuori, 1961: 167; Miyamoto, 1979: 30; Miyamoto & Yasunaga, 1989: 163; Schuh, 1995: 415.

Recognized by the somber dark dorsum sometimes with pale hemelytra especially in ♀, both brown setae and reclining sericeous pubescence on the pronotum and hemelytra, rows of obscure spots on the metafemur, and a characteristic subapical tooth of the right paramere (Fig. 1, I). This species has been regarded as a member of *Psallus*, having the similar dorsal vestiture (both sericeous pubescence and darker setae), but other external features and structure of the male genitalia, as previously mentioned by Miyamoto (1979), fit diagnostic characters of *Plagiognathus*. Detailed description and redescription were provided by Linnavuori (1961) and Miyamoto (1979), respectively.

Confirmed host plant is *Artemisia* sp., on which many teneral adults were collected at Daimonzawa, Yatsugatake Mts., Yamanashi Pref. One generation per year is assumed for *senjoensis*, and the newly emerged adults are found in late July.

Dimensions (♂ / ♀): Body length 4.2/ 3.6; head width 0.84/ 0.82; vertex width 0.44/ 0.48; lengths of antennal segment I 0.35/ 0.35, II 1.44/ 1.12, III 1.14/ 0.95, IV 0.60/ 0.54; rostral length 1.44/ 1.50; mesal pronotal length 0.60/ 0.58; basal pronotal width 1.21/ 1.20; width across hemelytra 1.44/ 1.50; lengths of metafemur 1.51/ 1.32, tibia 2.34/ 2.16, tarsus 0.60/ 0.59.

Material examined. JAPAN, Honshu: Fifty-three specimens (AMNH, HUES, SEHU) from the following localities: Kitazawa, Mt. Senjo (holotype ♂, AMNH); Mt. Hakusan, 2,100-2,300 m alt., Ishikawa Pref.; Ashiyasu Vil., Yamanashi Pref.; Daimonzawa, 2,000-2,500 m alt., Mt. Akadake, Yatsugatake Mts., Yamanashi Pref.

Distribution. Japan (montane areas of central Honshu).

Plagiognathus yomogi Miyamoto
(Fig. 4 E)

Plagiognathus yomogi Miyamoto, 1969: 88; Miyamoto & Yasunaga, 1989; Yasunaga et al., 1993: 147, pl. 6; Schuh, 1995: 392.

Recognized by the small size, shiny blackish dorsum, yellow legs, and distinct dark spots on the metafemur. It can be confused with *Pseudophylus stundjuki*, from which *yomogi* is separable by possession of the dark spots on the metafemur.

The breeding hosts are *Artemisia* spp., on which numerous adults and nymphs have been collected. One generation per year is assumed for *P. yomogi*.

Dimensions. ♂ / ♀: Body length 3.3/ 3.1; head width 0.65/ 0.66; vertex width 0.34/ 0.36; lengths of antennal segment I 0.30/ 0.30, II 1.06/ 0.97, III 0.75/ 0.70, IV 0.55/ 0.50; rostral length 1.20/ 1.20; mesal pronotal length 0.55/ 0.54; basal pronotal width 0.98/ 1.07; width across hemelytra 1.32/ 1.43; lengths of metafemur 1.16/ 1.21, tibia 1.74/ 1.80, tarsus 0.44/ 0.43.

Material examined. More than 120 specimens (HUES, SEHU) from the following localities: JAPAN: [Hokkaido] Oniwaki, Rishiri Is., Soya; Moshiri-Shirakaba, Horokanai; Etanbetsu, Asahikawa C.; Komuke, Monbetsu C.; Shiretoko Peninsula; Ashoro T.; Aoyama, Tobetsu T.; Takaoka, Tomakomai C. [Honshu] Sawaguchi, Oe T., Yamagata Pref.; Shikamatagawa, Niigata Pref.; Mt. Wasamata, Kamikitayama Vil., Nara Pref.; Kitamata, Kawakami Vil., Nara Pref.; Minamihizue, Shingu C., Wakayama Pref.; Yoshiwa Vil., Hiroshima Pref.; Mt. Kakezu, Geihoku T., Hiroshima Pref. [Shikoku] Nishikuma, Monobe Vil., Kochi Pref. [Kyushu] Mt. Shiratori, Izumi Vil., Kumamoto Pref. RUSSIA, Primor'je: NW of Krounovka, nr. Mt. Medvezh'ja; 10 km E of Novaja Moskva; Shkotobo; Ussury Natural Reserve; Rjazanovka, Khasanskij Dist.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu, Rishiri Is.), Russian Far East (Primorskij Kraj).

Compsidolon Reuter, 1899

Compsidolon Reuter, 1899: 147, type species: *C. elegantulum* Reuter, 1899, monotypic.

This is a relatively large genus comprising about 60 species in the Palearctic and Ethiopian Regions, and the members of the genus are easily recognized by the pale body with scattered dark spots on dorsum. A new and a little known species are here reported from Japan.

Compsidolon (Coniortodes) salicellum (Herrich-Schaeffer)
(Figs. 2 A; 5 A-C)

Capsus salicellus Herrich-Schaeffer, 1841: 47.

Compsidolon (Coniortodes) salicellum: Lattin & Messing, 1984: 179; Schuh, 1995: 298.

Compsidolon sp. Endo et al., 1998: 18.

Easily recognized by the small size, rather slender body, pale whitish dorsum with densely distributed, dark, small spots, and an obscure, lateral large spot on the membrane. This widely distributed species has been redescribed or reviewed by many authors (e.g., Lattin and Messing, 1984; Wagner, 1975; Wagner and Weber, 1964; Wheeler and Henry, 1992).

Confirmed breeding host in Japan is a walnut, *Juglans mandschurica* (Fig. 5, C-D), on which many nymphs were found, especially on the fruits (C). Some adults were also collected from *Artemisia* spp. (Fig. 5, A), *Rubus* sp. (Rosaceae) and *Salix* sp. (Salicaceae).

Dimensions (σ^3/φ): Body length 3.6/ 3.7; head width 0.71/ 0.70; vertex width 0.25/ 0.36; lengths of antennal segment I 0.32/ 0.31, II 1.42/ 1.38, III 0.94/ 0.86, IV 0.38/ 0.44; rostral length 1.50/ 1.56; mesal pronotal length 0.52/ 0.58; basal pronotal width 1.07/ 1.14; width across hemelytra 1.32/ 1.51; lengths of metafemur 1.44/ 1.44, tibia 2.16/ 2.28, tarsus 0.49/ 0.54.

Material examined. JAPAN: More than 100 specimens (HUES, SEHU) from the following localities: [Hokkaido] Moshiri-Shirakaba, Horokanai T.; Etanbetsu, Asahikawa C.; Kanehana, Rubeshibe T.; Aoyama & 4-ban-Riv., Tobetsu T.; Hattari, Atsuta Vil.; Mt. Teine, Sapporo C. [Honshu] Sugadaira (1,330 m), Nagano Pref.; Baba, Kaizuka C., Osaka Pref.; Yamada, Hashimoto C., Wakayama Pref. [Shikoku] Nishikuma, Monobe Vil., Kochi Pref.; Ryugado-Skyline, Kochi Pref.; Tengu Plateau, Higashitsuno Vil., Kochi Pref. [Kyushu] Shiramizu, Shonai T., Oita Pref.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Holarctic Region. The Nearctic populations are considered to have been introduced from the Palearctic Region (Wheeler and Henry, 1992).

Compsidolon (Chamaeliops) elaeagnicola n. sp.
(Figs. 2 B-D; 5 D & E)

Body generally somber yellowish white, slightly tinged with green, large, elongate oval; dorsal surface not strongly shining, densely clothed with both silvery, recumbent

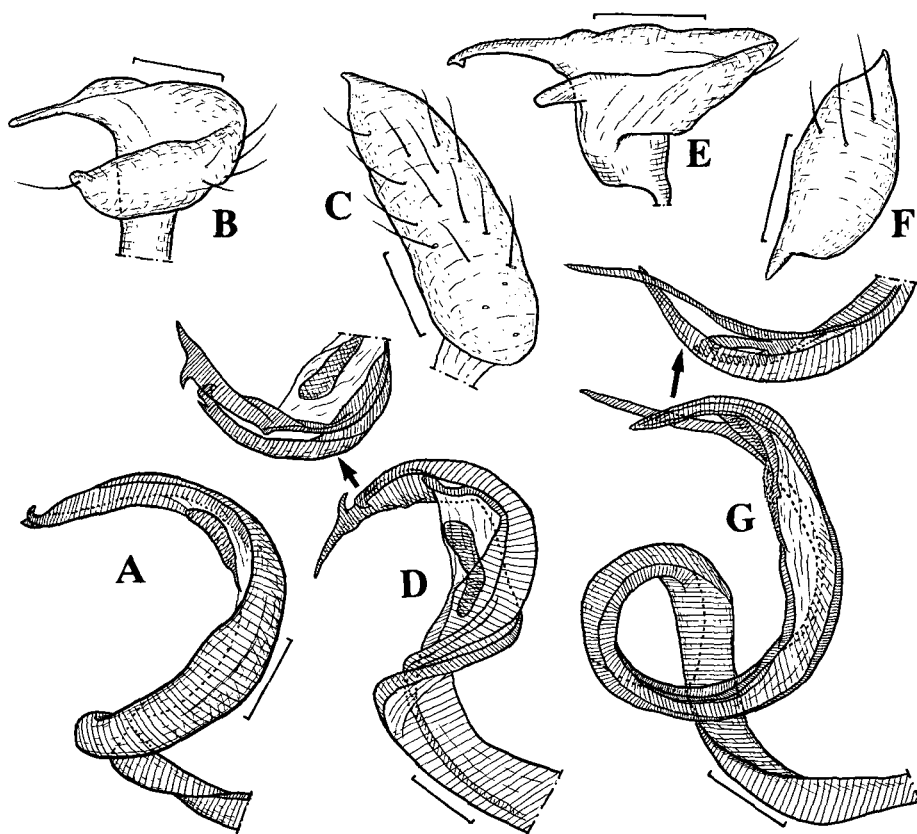


Fig. 2. Male genitalia of *Compsidolon salicellum* (A), *C. elaeagnicola* (B-D) & *Atractotomoidea castanea* (E-G). B & E, left paramere; C & F, right paramere; A, D & G, vesica. Scales: 0.1 mm.

pubescence and dark, suberect setae. Head subvertical, somewhat shagreened, with dense, silvery pubescence and several, dark, upright setae. Antenna pale brown; segment I with a few, dark, stiff setae apically; segments III and IV somewhat darker; lengths of segments I-IV (σ / φ): 0.35/ 0.31, 1.50/ 1.32, 1.02/ 0.94, 0.37/ 0.48. Rostrum pale whitish brown, short, rather broad, not exceeding apex of mesocoxa. Pronotum except calli, mesoscutum and scutellum with dark, small spots, bearing silvery, reclining pubescence and dark, suberect setae; mesoscutum with 4 dark, anterior spots that are usually concealed by posterior margin of the pronotum; scutellum with a pair of larger spots anteromesially; thoracic pleura unicolorously creamy white. Hemelytra densely provided with dark, small spots; cuneal spots sparser; membrane pale grayish brown, with posteriorly pale veins. Leg pale whitish brown; femur with scattered, small, dark spots; tibia with larger spots bearing blackish, strong spines; apical half of tarsomere III dark brown; lengths of metafemur, tibia and tarsus (σ / φ): 1.60/ 1.62, 2.46/ 2.40, 0.60/ 0.58. Abdomen pale whitish brown. Male genitalia (Fig. 2, B-D): Right paramere long and wide (C); vesica exhibiting peculiar structure (D).

Dimensions (σ / φ): Body length 4.6/ 4.6; head width 0.95/ 0.96; vertex width 0.38/ 0.45; rostral length 1.44/ 1.50; mesal pronotal length 0.78/ 0.78; basal pronotal width 1.56/

1.54; width across hemelytra 1.92/ 2.10.

Holotype ♂, Momiki, Izumi Vil., Kumamoto Pref., Kyushu, Japan, 24-25. v. 1990, T. Yasunaga (HUES). Paratypes: Thirty-nine specimens (HUES, SEHU) same data as for holotype and from Takayama-Inari, Shariki Vil., Aomori Pref., Honshu.

This new species is easily recognized by the large size. The dorsal coloration is cryptic, very harmonious with that of the breeding host plant, *Elaeagnus umbellata* of the Elaeagnaceae (Fig. 5, D). The last instar nymph is almost unicolorously white (E).

Atractotomoidea n. gen.

Type species: *Atractotomoidea castanea* Yasunaga, n. sp.

Related to the Holarctic genus *Atractotomus* Fieber, 1858, judging from the strongly twisted, spiral vesica with field of spines below gonopore (see Stonedahl, 1990), but the present new genus is distinct in having the following characters: Dorsal surface only with simple, pale, suberect pubescence, lacking any scale-like setae; antennal segment II cylindrical, not strongly incrassate; long antennal segment IV that is about as long as III; hemelytra with uniformly distributed, dark, small spots; left paramere with slender, apically hooked hypophysis (Fig. 2 E); right paramere short (F); vesica coiled mesially, with distinctly bifurcate apex (G).

Atractotomoidea is currently represented by a single Japanese species.

Atractotomoidea castanea n. sp.

(Figs. 2 E-G; 5 E)

Body generally chestnut brown, partly tinged with red, oval, small; dorsal surface densely clothed with a simple, silky, long, suberect pubescence. Head short, smooth, bearing silky, suberect pubescence; eye furnished with distinct setae. Antenna dark brown; segment II pale brown at basal 1/2-2/3, incrassate in ♂; segment III and IV filiform, almost equal in length; lengths of segments I-IV (♂ / ♀): 0.22/ 0.18, 0.82/ 0.78, 0.36/ 0.37, 0.37/ 0.36. Rostrum brown, slender, reaching apex of hind coxa; segments I and IV darker. Pronotum weakly carinate laterally; scutellum flat; thoracic pleura darker, widely shagreened or pruinose. Hemelytra uniformly with dark, somewhat convex spots, densely pubescent; membrane dark grayish brown, with reddish veins. Coxa and leg dark chestnut brown; apex of coxa and trochanter pale reddish brown; tibia paler, with pale brown, long spines; tarsus brown, with darker apical part of tarsomere III; lengths metafemur, tibia and tarsus (♂ / ♀): 0.96/ 0.90, 1.44/ 1.40, 0.32/ 0.35. Abdomen almost unicolorously dark chestnut brown. Male genitalia as in generic diagnosis.

Dimensions (♂ / ♀): Body length 2.5/ 2.6; head width 0.64/ 0.56; vertex width 0.26/ 0.29; rostral length 1.10/ 1.08; mesal pronotal length 0.46/ 0.42; basal pronotal width 0.96/ 0.96; width across hemelytra 1.30/ 1.26.

Holotype ♂, Nameshi, Nagasaki City, Kyushu, Japan, on azalea, 31. vii. 1996, T. Yasunaga (HUES). Paratypes: Fourteen specimens (HUES, SEHU) from the following localities: [Hokkaido] Nodaoi Park, Yakumo T. [Honshu] Mitsumenaigawa, Oowani T., Aomori C., Aomori Pref.; Tsubakiotoge, Ohtoh Mts., Wakayama Pref.; Oishi, Kanaya T., Wakayama Pref. [Shikoku] Hongawa Vil., 800-1,400 m alt., Kochi Pref.; Ohishi, Motoyama T., Kochi Pref.; Mt. Shiraga, 600-1,400 m alt., Monobe Vil., Kochi Pref. [Kyushu] Konoura, Sotome T., Nagasaki Pref.; same as holotype.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu).

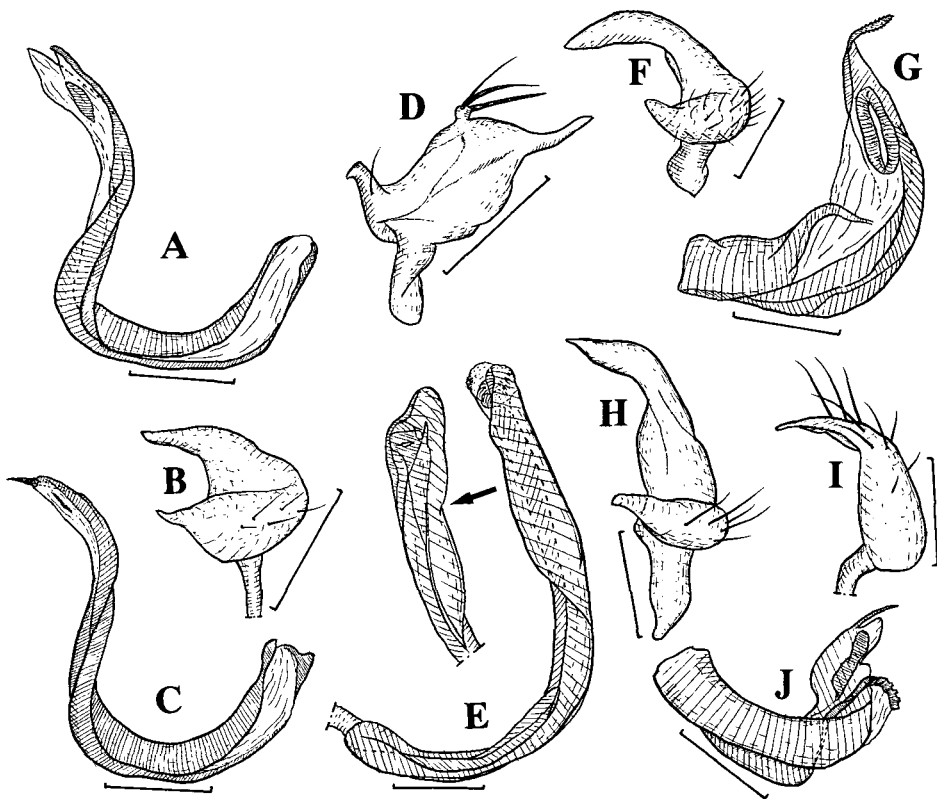


Fig. 3. Male genitalia of *Phoenicocoris kyushuensis* (A), *P. ryukyuensis* (B & C), *Decomia okutoshii* (D & E), *Opuna pallidula* (F & G) & *Moissonia befui* (H-J). B, D, F & H, left paramere; I, right paramere; A, C, E, G & J, vesica. Scales: 0.1 mm.

This new species is easily recognized by the chestnut brown general coloration and dark, somewhat convex spots on the hemelytra (Fig. 5 F). It has been collected from various plants, such as *Rhododendron* spp. of the Ericaceae, *Quercus mongolica* of the Fagaceae, *Chamaecyparis obtusa* of the Cupressaceae, *Abies sachalinensis* of the Pinaceae, and *Cephalotaxus harringtonia* of the Cephalotaxaceae. The nymphs, that exhibits generally red coloration, have hitherto found only on the azaleas.

Phoenicocoris Reuter, 1875

Plagiognathus (*Phoenicocoris*) Reuter, 1875: 1: 99, type species: *Capsus modestus* Meyer-Dür, 1843, monotypic.

Phoenicocoris (as distinctive genus): Kerzhner, 1962: 381.

The Holarctic genus *Phoenicocoris* contains 16 species, and only *P. kyushuensis* has been known from Japan. This is liable to be confused with the large Holarctic genus *Psallus* Fieber. Although diagnostic characters of each genus were provided by Wagner (1975), it is sometimes difficult to distinguish them consistently without examining the male genitalia. Two Japanese members of *Phoenicocoris* are recognized by the rather elongate body,

principally brown general coloration, dense sericeous reclining pubescence on dorsum, slender ♂ abdomen, and simple form of the vesica, in addition to being pine inhabitants.

Phoenicocoirs kyushuensis (Linnavuori, 1961)

(Figs. 3 A; 5 G)

Psallus kyushuensis Linnavuori, 1961: 168.

Phoenicocoris kyushuensis: Kerzhner, 1988b: 75; Miyamoto & Yasunaga, 1989: 163; Schuh, 1995: 374.

Recognized by elongate oval body, dense dark setae and sericeous pubescence on dorsum, dark brown pronotum, pale brown hemelytra, and simple vesica that lacks any apical projection (Fig. 3, A).

This species is associated with pinaceous *Pinus densiflora* (Fig. 5, G), and bivoltine life cycles are assumed for populations in southern Japan.

Dimensions. ♂ / ♀ : Body length 3.2/ 3.2; head width 0.80/ 0.76; vertex width 0.24/ 0.30; lengths of antennal segment I 0.30/ 0.30, II 1.28/ 1.04, III 0.84/ 0.74, IV 0.50/ 0.48; rostral length 1.44/ 1.46; mesal pronotal length 0.48/ 0.49; basal pronotal width 1.00/ 1.07; width across hemelytra 1.24/ 1.32; lengths of metafemur 1.32/ 1.26, tibia 2.04/ 1.98, tarsus 0.48/ 0.48.

Material examined. JAPAN: Eighteen specimens (AMNH, HUES) from the following localities: [Honshu] Ichie, Hikigawa T., Wakayama Pref.; San'yo T., Okayama Pref.; Yawata Plateau, Geihoku T., Hiroshima Pref. [Shikoku] Monobe Vil. & Sukumo C., Kochi Pref. [Kyushu] Fukuoka (holotype ♂, AMNH); Hakozaki, Kyushu Univ. Campus, Fukuoka City; Konoura, Sotome T., Nagasaki Pref.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Russian Far East (Primorskij Kraj), Korea.

Phoenicocoris ryukyuensis n. sp.

(Figs. 3 B & C; 5 H)

Body nearly parallel-sided (♂), elongate oval (♀); dorsal surface usually dark brown, densely clothed with dark, suberect setae and silvery, reclining pubescence. Head dark brown, subshining, weakly pruinose, subvertical, bearing dense, brown, suberect setae. Antenna dark brown; segments I and II yellowish brown in some specimens (especially in ♀); lengths of segments I-IV (♂/♀): 1.26/ 1.08, 0.84/ 0.72, 0.48/ 0.45, 1.26/ 1.28. Rostrum brown, sometimes tinged with red, reaching apex of metacoxa. Pronotum dark chestnut brown, subshining, weakly shagreened; scutellum dark brown, sometimes reddish brown, flat; thoracic pleura dark brown, tinged with red, with usually reddish brown ostiolar peritreme. Hemelytra dark brown, sometimes reddish brown especially in ♀, shining; membrane pale grayish brown. Coxa and leg dark brown; extreme apex of coxa and trochanter pale brown; tibia brown to dark brown, with brown, long spines; tarsus brown; lengths of metafemur, tibia and tarsus (♂/♀): 1.26/ 1.28, 1.86/ 1.82, 0.48/ 0.49. Abdomen dark brown, widely tinged with red. Male genitalia (Fig. 3 B-C): Vesica with a pointed process at apex (C).

Dimensions (♂ / ♀): Body length 3.2/ 3.4; head width 0.80/ 0.77; vertex width 0.26/ 0.32; rostral length 1.32/ 1.31; mesal pronotal length 0.50/ 0.51; basal pronotal width 1.04/ 1.13; width across hemelytra 1.20/ 1.44.

Holotype ♂, Sate, Kunigami Vil., Okinawa Is., the Ryukyus, Japan, 24. v. 1993, T. Yasunaga (HUES). Paratypes: Thirty-five specimens (HUES, SEHU) from the following localities: Ryukyus: [Okinawa Is., Kunigami Vil.] Yona; same as holotype; Benoki; Mt. Terukubi. [Ishigaki Is.] Mt. Bansei (Maese); Mt. Buzama; Kuura.

Distribution. Japan (Ryukyus: Okinawa and Ishigaki Isls.).

This new species is closely related to the preceding one, from which it can be distinguished by the darker general coloration and different shape of the vesica. *P. ryukyuensis* is associated with pinaceous *Pinus luchuensis*, and frequently attracted to light.

Decomia Poppius, 1915

Decomia Poppius, 1915: 73, type species: *D. cephalotes* Poppius, 1915: 74, monotypic.

This genus is composed of more than 30 members in the Oriental Region, New Guinea, Samoa and Taiwan, and is readily recognized by the oval body, smooth and rounded head, and hyaline and partly infusate hemelytra. Detailed diagnostic characters and redescription were provided by Schuh (1984).

Decomia okutoshii n. sp. (Figs. 3 D & E; 6 A)

Male. Body generally pale brown, oval; dorsal surface shining, uniformly clothed with a simple, pale, short setae. Head rounded, smooth. Antenna pale brown; segment II about as thick as I; segments III and IV somewhat darker; lengths of segments I-IV: 0.11, 0.46, 0.24, 0.23. Rostrum pale brown, reaching metacoxa; segment I tinged with red. Pronotum subshining, rather shagreened; scutellum flat, with narrowly infusate apex; thoracic pleura reddish brown, with ventral margin of propleuron fuscous. Hemelytra hyaline, shining, minutely punctate, with dark apices of clavus, embolium and cuneus; membrane brownish hyaline, with dark veins. Leg pale brown; metafemur conspicuously tumid, with irregularly sanguineous apex; tibial spines pale brown, prominent; lengths of metafemur, tibia and tarsus: 0.66, 0.90, 0.36. Abdomen pale orange brown, somewhat darkened sublaterally; apex of genital segment infusate. Male genitalia (Figs. 3, D-E): Left paramere with a dorsal process bearing a few, strong setae (D); vesica with a small, subapical process (E).

Dimensions: Body length 1.8; head width 0.56; vertex width 0.32; rostral length 0.73; mesal pronotal length 0.30; basal pronotal width 0.78; width across hemelytra 0.94.

Female. Unknown.

Holotype ♂, Mt. Yarabudake, Ishigaki Is., Okinawa Pref., Ryukyus, Japan, 2. x. 1998, light trap, K. Takahashi (HUES).

Distribution. Japan (Ishigaki Is.).

Judging from the shape of left paramere, this new species is allied to *D. microgonaporos* Schuh, 1984, from which *okutoshii* is easily distinguished by the infusate apex of the scutellum and 3 pairs of fuscous spots on the hemelytra. *Decomia okutoshii* is fairly rare, currently known by a single male.

Opuna Kirkaldy, 1902

Opuna Kirkaldy, 1902: 140, type species: *O. hawaiiensis* Kirkaldy, 1902, a synonym of *O. sharpianus* Kirkaldy, 1902, monotypic.

This is a small genus containing 6 species from the Old World tropics and Hawaii, and is recognized by the principally hyaline hemelytra, flattened and apically convergent parempodia, and simple form of the vesica. Diagnostic characters were provided and discussed by Schuh (1984).

Opuna annulata (Knight) (Fig. 6 B)

Campylomma annulatus Knight, 1935: 197.

Opuna annulata: Schuh, 1984: 401; 1995: 366.

Easily recognized by the pale green general coloration, dark setae on dorsum, distinctly annulate antennal segment II, and hyaline hemelytra with two inner dark spots on the cuneus. This species is widely distributed in the Indo-Pacific, but in Japan, only a single record has been known from Okinawa Island (Schuh, 1984).

Dimensions (σ / φ): Body length 2.3/ 2.5; head width 0.65/ 0.71; vertex width 0.37/ 0.43; lengths of antennal segment I 0.14/ 0.16, II 0.62/ 0.64, III 0.50/ 0.54, IV 0.36/ 0.38; rostral length 0.72/ 0.72; mesal pronotal length 0.36/ 0.41; basal pronotal width 0.86/ 1.03; width across hemelytra 1.06/ 1.26; lengths of metafemur 0.84/ 0.96, tibia 1.26/ 1.38, tarsus 0.40/ 0.40.

Material examined. JAPAN: Eighteen specimens (HUES, SEHU) from the following localities of the Ryukyus: Shuri-sakiyama, Naha C., Okinawa Is.; Maesato & Yoshihara, Ishigaki Is.; Funaura, Iriomote Is.

Distribution. Japan (Ryukyus: Okinawa, Ishigaki and Iriomote Isls.), Taiwan, SE China, Oriental Region, New Guinea, Micronesia.

Opuna pallidula n. sp. (Figs. 3 F & G; 6 C)

Body unicolorously pale green, oval; dorsal surface shining, uniformly clothed with silvery, reclining pubescence and dark, suberect setae. Head short, slightly oblique, with silvery pubescence; vertex with several, dark, upright setae basally; tylus with a few dark setae mesially. Antenna yellowish brown; segments III and IV somewhat darker; lengths of segments I-IV (σ / φ): 0.18/ 0.20, 0.84/ 0.84, 0.64/ 0.66, 0.42/ 0.42. Rostrum yellow, short, reaching mesial part of mesocoxa; apical part of segment IV infusate. Pronotum short, about half length of basal width; scutellum flat. Hemelytra hyaline, minutely punctate; membrane brownish hyaline. Pro- and mesofemora with small brown spots apically; metafemur provided with larger fuscous spots (some bearing trichobothria and others doing fuscous spines); tibial spines blackish brown, prominent; tarsus pale brown, with darkened tarsomere III; lengths of metafemur, tibia and tarsus (σ / φ): 1.08/ 1.08, 1.60/ 1.68, 0.45/ 0.47. Male genitalia (Fig. 4, F-G): Vesica broad, with tapered and spinulate apex (G).

Dimensions (σ / φ): Body length 2.8/ 3.1; head width 0.72/ 0.72; vertex width 0.37/ 0.42; rostral length 0.86/ 0.95; mesal pronotal length 0.48/ 0.48; basal pronotal width 1.02/

1.13; width across hemelytra 1.39/ 1.44.

Holotype ♂, Yona, Kunigami Vil., Okinawa Is., Ryukyus, Japan, 20-25. iv. 1993, light trap, T. Yasunaga (HUES). Paratypes: Ten specimens (HUES, SEHU) with same data as for holotype & from Maesato, Ishigaki Is., the Ryukyus.

This new species is similar in general appearance to a Malaysian species, *Opuna maai* Schuh, 1984, from which it is easily distinguished by the almost unicolorous pale dorsum with the distinct dark setae and silvery pubescence (Fig. 6, C).

Because all known specimens of *pallidula* were collected by light traps, no information is available on its biology.

Moissonia Reuter, 1894

Moissonia Reuter, 1894: 148, type species: *Agallistes punctatus* Fieber, 1861, monotypic.

This genus resembles *Opuna*, but is characteristic in having a ventral longitudinal keel on the male genital segment and a series of notches of the vesica. Detailed diagnostic characters and redescription were provided by Schuh (1984) as its synonym, *Ellenia* Reuter. *Moissonia* includes more than 30 species mainly from the Old World tropics and subtropics.

Moissonia punctata (Fieber) (Fig. 6 D & E)

Agallistes punctatus Fieber, 1861: 311.

Moissonia punctata: Reuter, 1894: 149; Schuh, 1995: 356.

Opuna sp. Yasunaga et al., 1993: 163, pl. 23.

Easily recognized by the pale green dorsum with distinct dark spots, and widely darkened base and apex of antennal segment II. The dorsal coloration (especially, number of dorsal dark spots) is variable (Fig. 6, D & E). Diagnostic characters were provided by Schuh (1984) as a synonym, *Ellenia obscuricornis* Poppius, 1915.

Moissonia punctata is widely known from the Old World tropics and subtropics, but in Japan, has been recorded only from the Ogasawara Islands as *Opuna* sp. (Yasunaga et al., 1993). I collected many specimens by sweeping the herbaceous plants, but the breeding hosts are yet to be determined.

Dimensions (♂ / ♀): Body length 2.8/ 3.0; head width 0.74/ 0.76; vertex width 0.39/ 0.42; lengths of antennal segment I 0.17/ 0.17, II 0.72/ 0.67, III 0.59/ 0.47, IV 0.36/ 0.30; rostral length 0.73/ 0.76; mesal pronotal length 0.46/ 0.47; basal pronotal width 1.03/ 1.10; width across hemelytra 1.18/ 1.30; lengths of metafemur 0.96/ 0.96, tibia 1.56/ 1.44, tarsus 0.48/ 0.42.

Material examined. JAPAN: Ninety-two specimens (HUES, SEHU) from the following localities: [Ryukyus] Yona of Kunigami Vil., Shurisakiyama of Naha C., Motobu Peninsula & Chinen Peninsula, Okinawa Is.; Omoto & Mt. Ban'na, Ishigaki Is.; Funaura, Monbanare & Shirahama, Iriomote Is.; Mt. Donan, Yonaguni Is. [Ogasawara (Bonin)] Oki Vil. and Kita Vil., Hahajima Is.

Distribution. Japan (Ogasawara Isls.: Hahajima Is., Ryukyus: Okinawa, Ishigaki, Iriomote and Yonaguni Isls.), Taiwan, Old World tropics and subtropics, Spain.

Moissonia befui n. sp.
(Figs. 3 H-J; 6 F)

Body generally pale green, oval; dorsal surface furnished with silvery, short, reclining pubescence and dark, suberect setae. Head rather rounded, with dark spots bearing upright setae. Antenna pale brown; segment I with two dark rings dorsally obliterate; segment II with dark, basal narrower and apical broader annulations; extreme base and apex of segment II pale; segments III and IV dark brown; lengths of segments I-IV (σ / φ): 0.18/ 0.17, 0.90/ 0.79, 0.56/ 0.53, 0.40/ 0.38. Pronotum shining, usually with many dark spots; mesoscutum and scutellum usually widely darkened mesally; thoracic pleura unicolorous. Hemelytra hyaline, with 3 pairs of spots at apices of corium and embolium, and inner mesial part of cuneus; membrane brownish hyaline. Femur with dark spots apically; tibia with black, long spines; tarsus pale brown; lengths of metafemur, tibia and tarsus (σ / φ): 0.96/ 1.02, 1.56/ 1.56, 0.42/ 0.40. Male genitalia (Fig. 4 H-J): Genital segment ventrally with apical, dark, longitudinal keel; vesica with 4-5 notches and a pointed, slender, apical process (J).

Dimensions (σ / φ): Body length 2.8/ 2.8; head width incl. eyes 0.74/ 0.76; vertex width 0.36/ 0.37; rostral length 1.08/ 1.15; mesal pronotal length 0.49/ 0.52; basal pronotal width 1.08/ 1.15; width across hemelytra 1.28/ 1.38.

Holotype σ , Imanoyama, Tosashimizu C., Kochi Pref., Shikoku, Japan, 29. viii. 1998, T. Befu (HUES). Paratypes: Six specimens (HUES) from the following localities: [Shikoku] Nissho, Nankoku C., Kochi Pref. [Kyushu] Nokonoshima Is., Fukuoka C., Fukuoka Pref.; Azuma T., Minamitakagi-gun, Nagasaki Pref.

This species is easily distinguished from *M. punctata* by the narrow apical and basal annulations of the antennal segment II, and the unicolorously hyaline hemelytra lacking the scattered dark spots. *Moissonia befui* is a single temperate inhabitant within the congeners.

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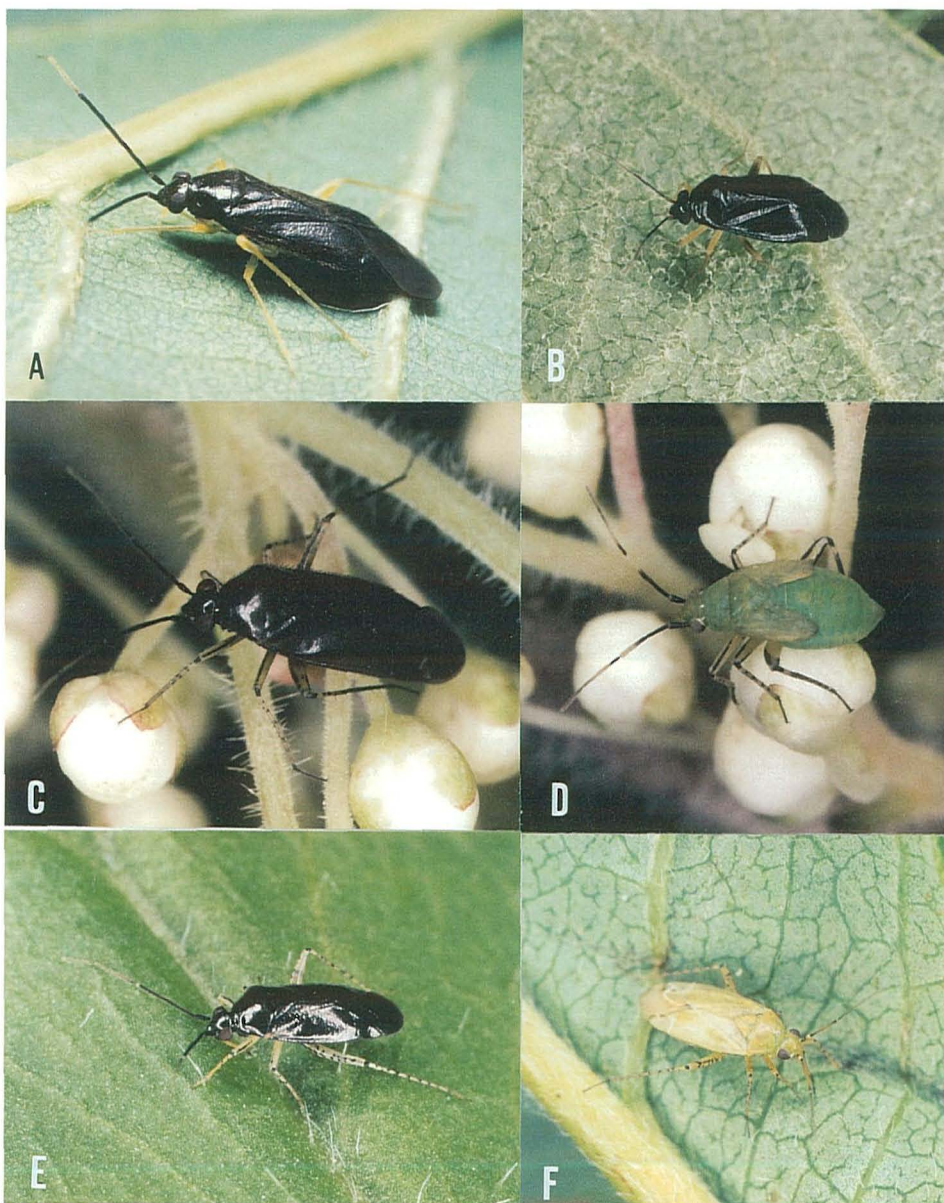


Fig. 4. Adults (A, B, C, E & F) & final instar nymph (D) of *Phylus miyamotoi* (A), *Pseudophylus stundjuki* (B), *Plagiognathus collaris* (C & D), *Pl. yomogi* (E) & *Pl. chrysanthemi* (F).

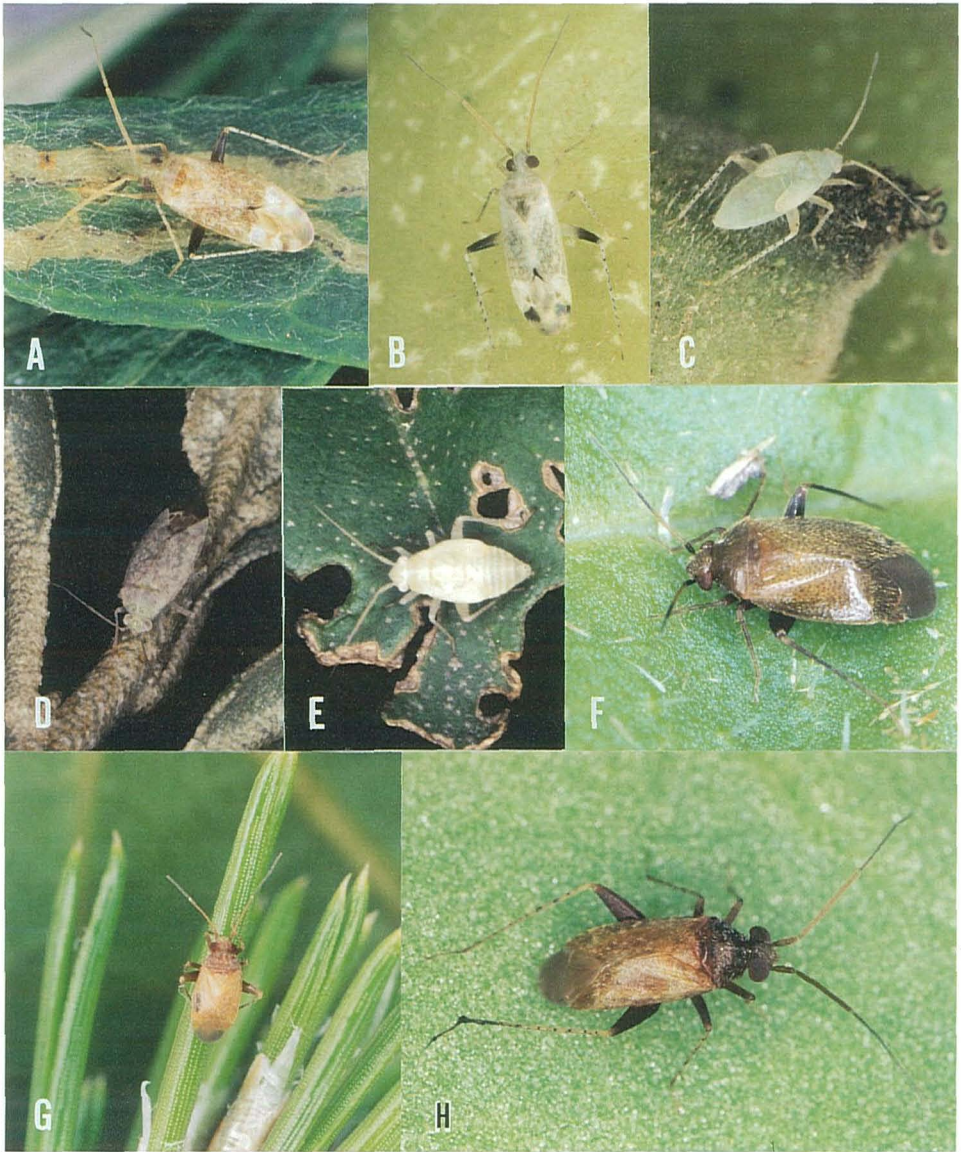


Fig. 5. Adults (A, B, D, F & H) & final instar nymphs (C & E) of *Compsidolon salicellum* (A-C), *C. elaeagnicola* (D & E), *Atractotomoidea castanea* (F), *Phoenicocoris kyushuensis* (G) & *P. ryukyuensis* (H).

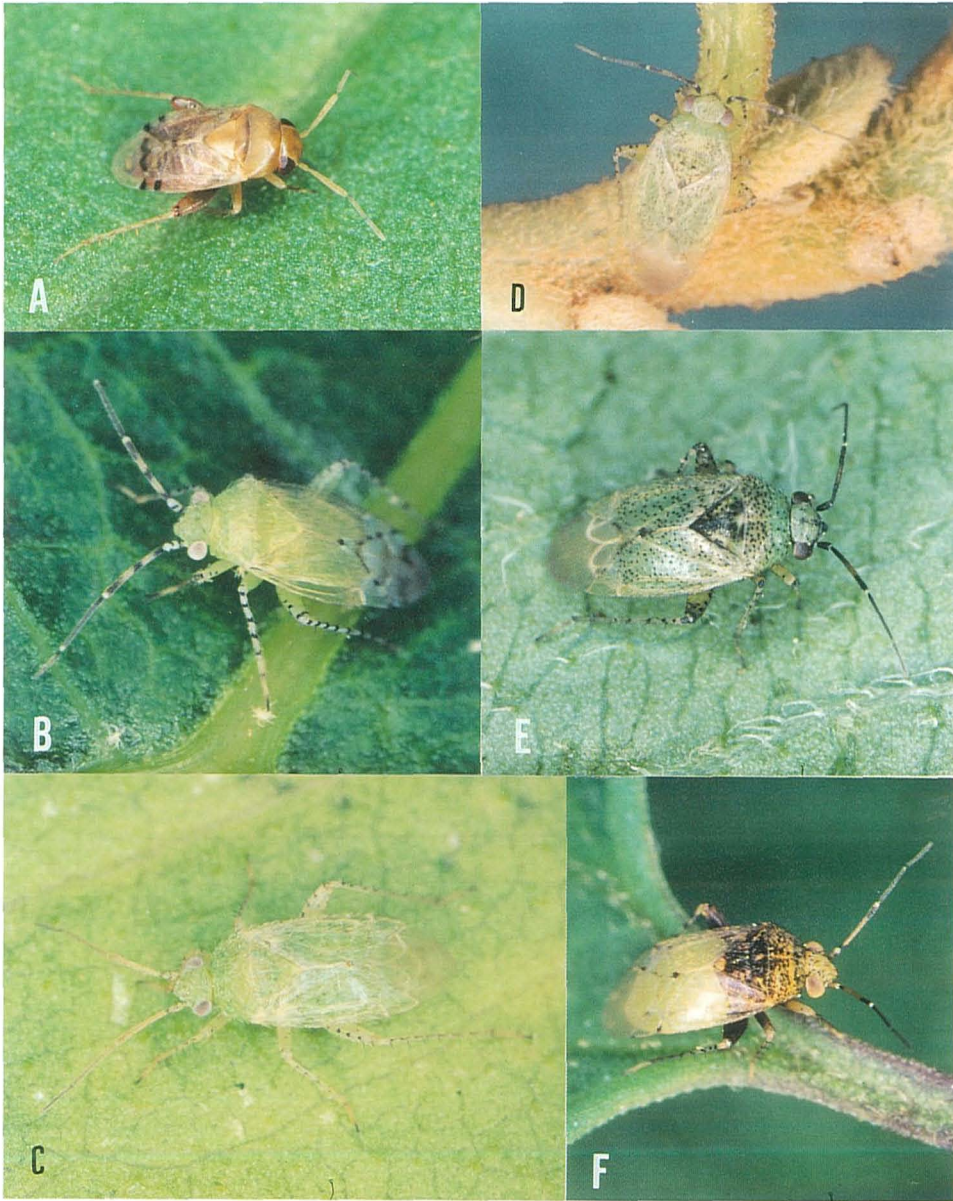


Fig. 6. Adults of *Decomia okutoshii* (A), *Opuna annulata* (B), *O. pallidula* (C), *Moissonia punctata* (D & E) & *M. befui* (F).